ABSTRACT

A digitized tomosynthesis method, system and apparatus is provided for obtaining 3D volumetric imaging of an object wherein a ray of energy from a source travels through the object to impinge on an energy sensor defining an image plane and the object is rotated about an axis whereby an image is acquired by the energy sensor at successive rotational positions of the object, and whereinthe object is rotated about an axis of rotation at a canted angle with respect to the image plane. In specific embodiments, the energy is in the form of electromagnetic radiation, particularly x-ray radiation, and the energy sensor is a flat panel digital detector. A ray of energy from the source is mathematically traced through a voxel of the object space to the image plane, the coordinate of the shadow of the voxel on the image plane is computed for each object rotation, and the image data is extracted and combined to form the object space voxel. In preferred embodiments, the optical axis of the source is perpendicular to the image plane, but other geometries are useful.